

FIG. 1

MICROPHONE SYSTEM OF THE INVENTION

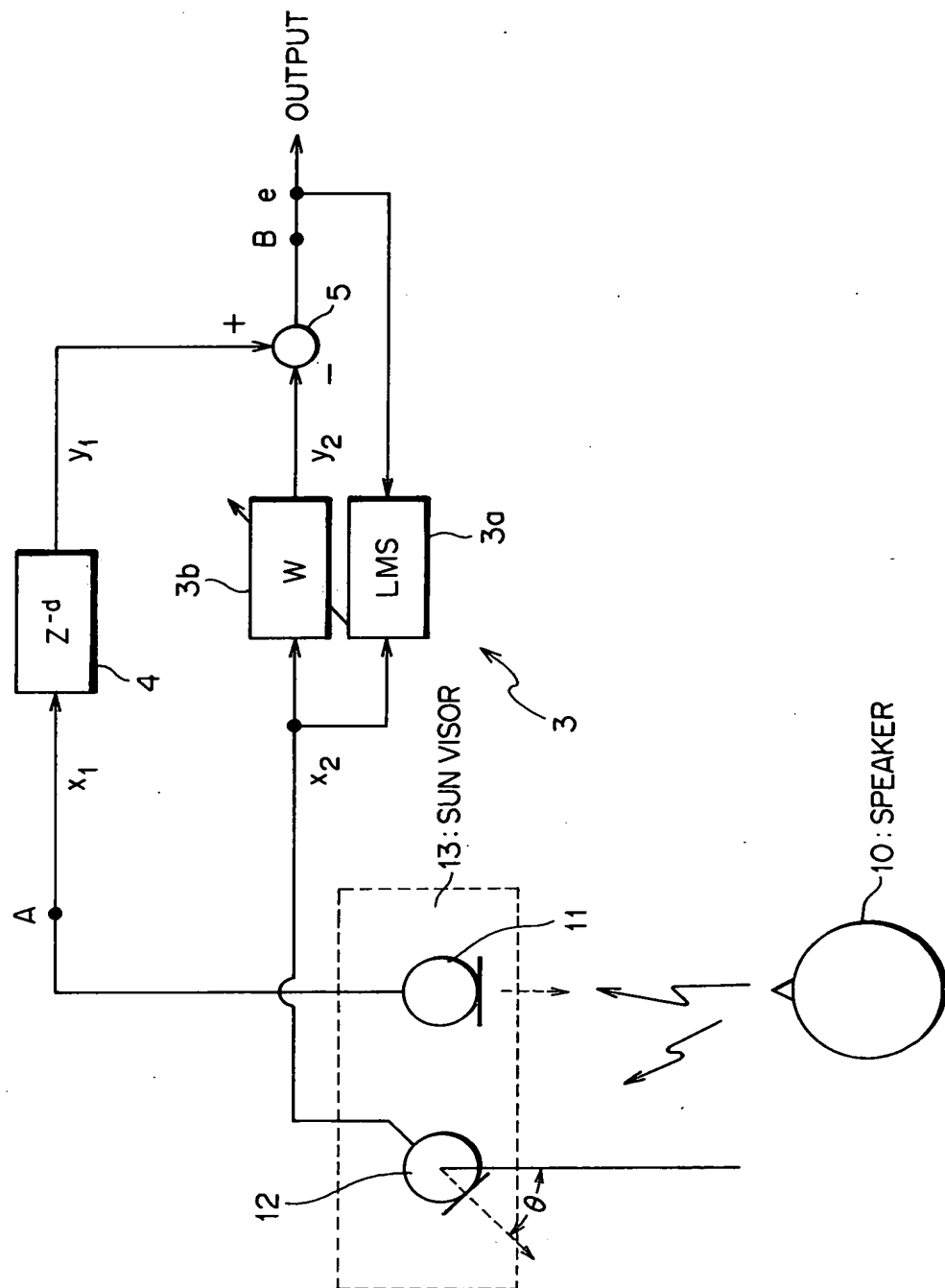
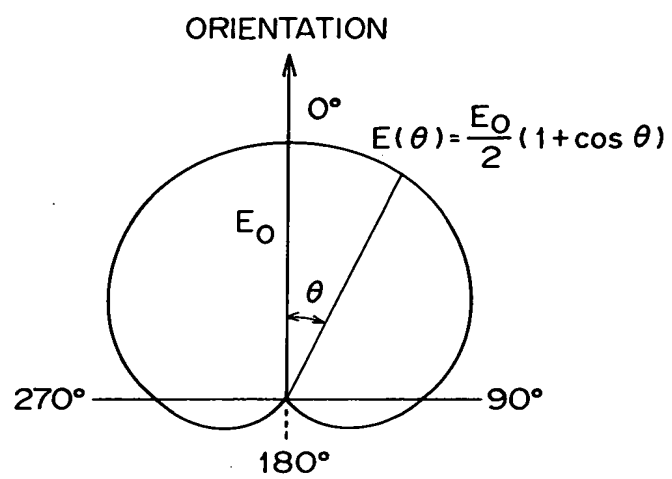


FIG. 2

ILLUSTRATION DIRECTIONAL CHARACTERISTICS



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ILLUSTRATION MICROPHONE LAYOUT

FIG. 3(a)

CASE : MOUNTING MICROPHONE ON THE SUN VISOR

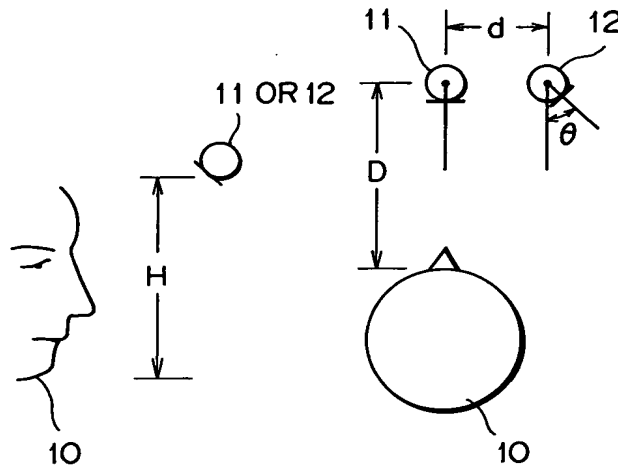
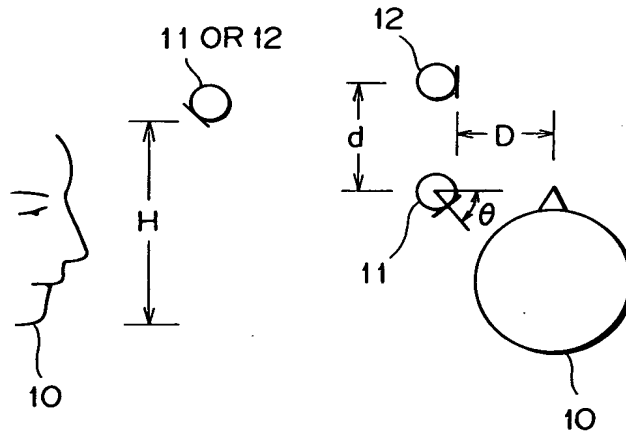


FIG. 3(b)

CASE : MOUNTING MICROPHONE ON THE CEILING ABOVE THE DRIVER'S ASSISTANT SEAT



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TABLE : SN IMPROVEMENT RATE WHEN VARYING THE ORIENTATION OF THE MICROPHONE ON THE RIGHT SIDE MOUNTED ON THE SUN VISOR

FIG. 4(a)

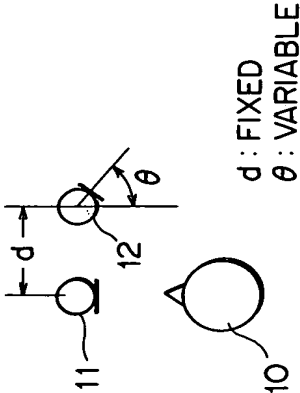
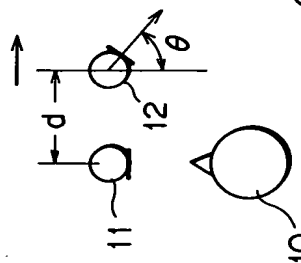


FIG. 4(b)

BEFOR NR AFTER NR												
CONDITION		HACHINOHE		KESENNUMA		YUKUHASHI		SAPPORO		KITAMI		AVERAGE IMPROVEMENT RATE
SUN VISOR $\theta = 45^\circ$	Ps	-11.3	-12.0	-14.2	-14.7	-15.2	-15.9	-10.6	-10.3	-11.5	-11.9	NR RATE : 5.83 O
	Pn	-17.0	-21.7	-17.0	-21.7	-17.0	-21.7	-17.0	-21.7	-17.0	-21.7	
	SNR	5.6	9.7	2.7	7.0	1.7	5.8	6.3	11.4	5.4	9.8	
	IMPROVEMENT RATE	4.1		4.2		4.1		5.1		4.3		
												4.3

TABLE : SN IMPROVEMENT RATE WHEN MOVING THE MICROPHONE ON THE RIGHT SIDE
MOUNTED ON THE SUN VISOR WITH THE ANGLE OF 60°

FIG. 5(a)



$\theta = 60^\circ$: FIXED
d: VARIABLE

FIG. 5(b)

BEFOR NR AFTER NR												
CONDITION	HACHINOHE			KESENNUMA		YUKUHASHI		SAPPORO		KITAMI		AVERAGE IMPROVEMENT RATE
SUN VISOR d = 9cm θ = 60°	Ps	-14.6	-13.6	-13.5	-11.6	-15.6	-13.7	-12.3	-9.5	-10.3	-6.7	NR RATE : 4.51 O
	Pn	-17.6	-20.0	-17.6	-20.0	-17.6	-20.0	-17.6	-20.0	-17.6	-20.0	
	SNR	3.0	6.4	4.1	8.4	2.0	6.3	5.3	10.5	7.3	13.3	
	IMPROVEMENT RATE	3.5		4.3		4.4		5.2		6.0		

TABLE : SN IMPROVEMENT RATE WHEN MOUNTING THE MICROPHONES ON THE CEILING ABOVE THE DRIVER'S ASSISTANT SEAT PERPENDICULARY TO THE SPEAKER'S VOCALIZING DIRECTION, AND MOVING ONE ON THEM

FIG. 6(a)

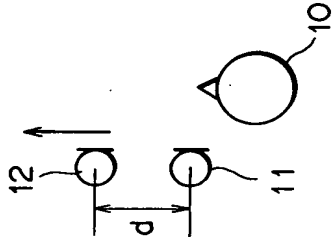


FIG. 6(b)

CONDITION	HACHINOHE	KESENNUMA	YUKUHASHI	SAPPORO	KITAMI	AVERAGE IMPROVEMENT RATE
CEILING ABOVE THE DRIVER'S ASSISTANT SEAT d= 7.5cm	P _s	-12.6 -17.1	-13.5 -17.1	-12.3 -15.0	-8.8 -11.1	NR RATE : 3.90 O
	P _n	-12.8 -20.8	-12.8 -20.8	-12.8 -20.8	-12.8 -20.8	
	SNR	0.7 4.6	0.6 3.6	0.6 5.8	4.0 9.6	
	IMPROVEMENT RATE	4.0	3.6	5.2	5.6	
						4.5

TABLE : SN IMPROVEMENT RATE WHEN MOUNTING THE MICROPHONES FORWARD ON THE CEILING ABOVE THE DRIVER'S ASSISTANT SEAT AND VARYING THE DISTANCE BETWEEN THEM

FIG. 7(a)

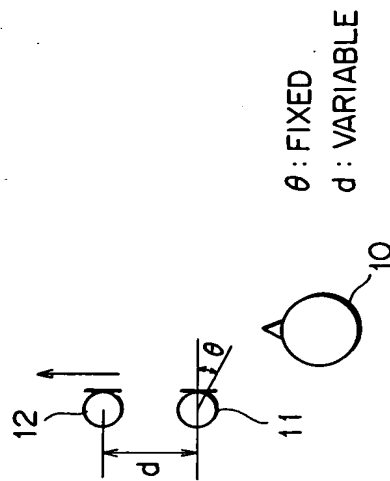


FIG. 7(b)

CONDITION	BEFORE NR AFTER NR											
	HACHINOHE	KESENNUMA	YUKUHASHI	SAPPORO	KITAMI		AVERAGE IMPROVEMENT RATE					
	Ps	-14.3 -14.0	-13.0 -13.7	-15.9 -15.5	-11.2 -11.7	-10.4 -11.0	NR RATE : 5.77		O			
	Pn	-20.2 -24.7	-20.2 -24.7	-20.2 -24.7	-20.2 -24.7	-20.2 -24.7						
CEILING ABOVE THE DRIVER'S ASSISTANT SEAT $d = 2\text{cm}$	SNR	6.0 10.7	6.5 11.0	8.5 9.2	9.3 13.0	9.3 13.8						
	IMPROVEMENT RATE	4.7	4.5	4.5	4.5	4.5						

FIG. 8

ANOTHER CONFIGURATION OF MICROPHONE SYSTEM

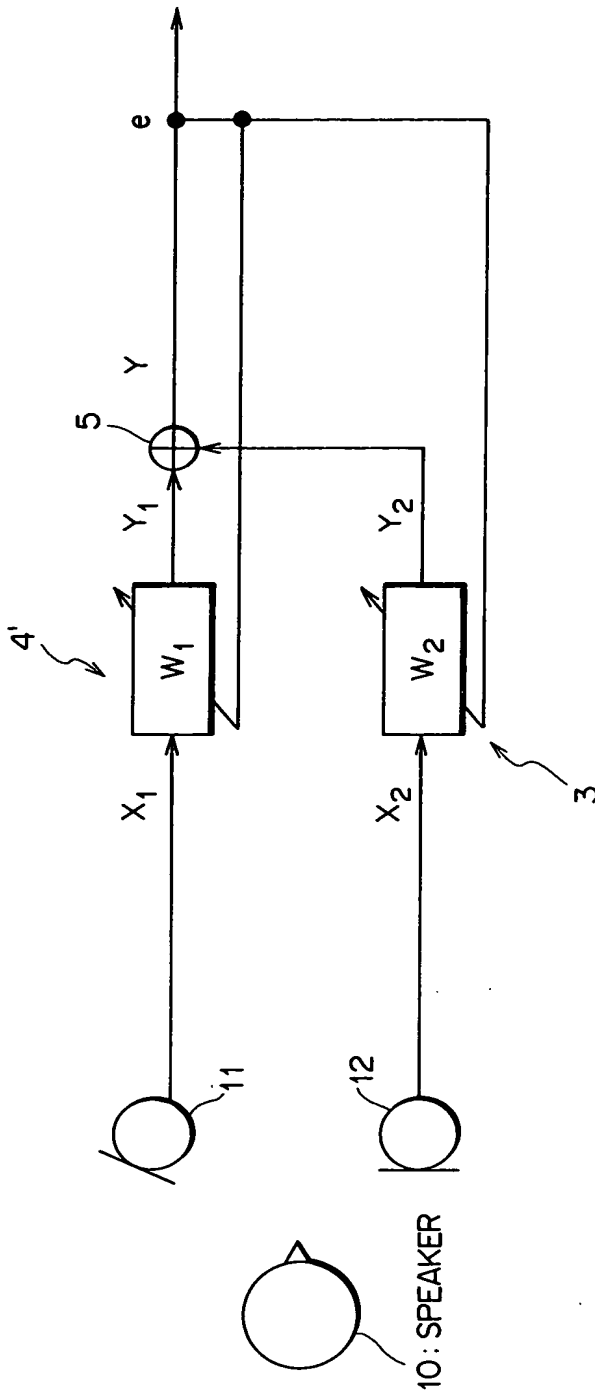
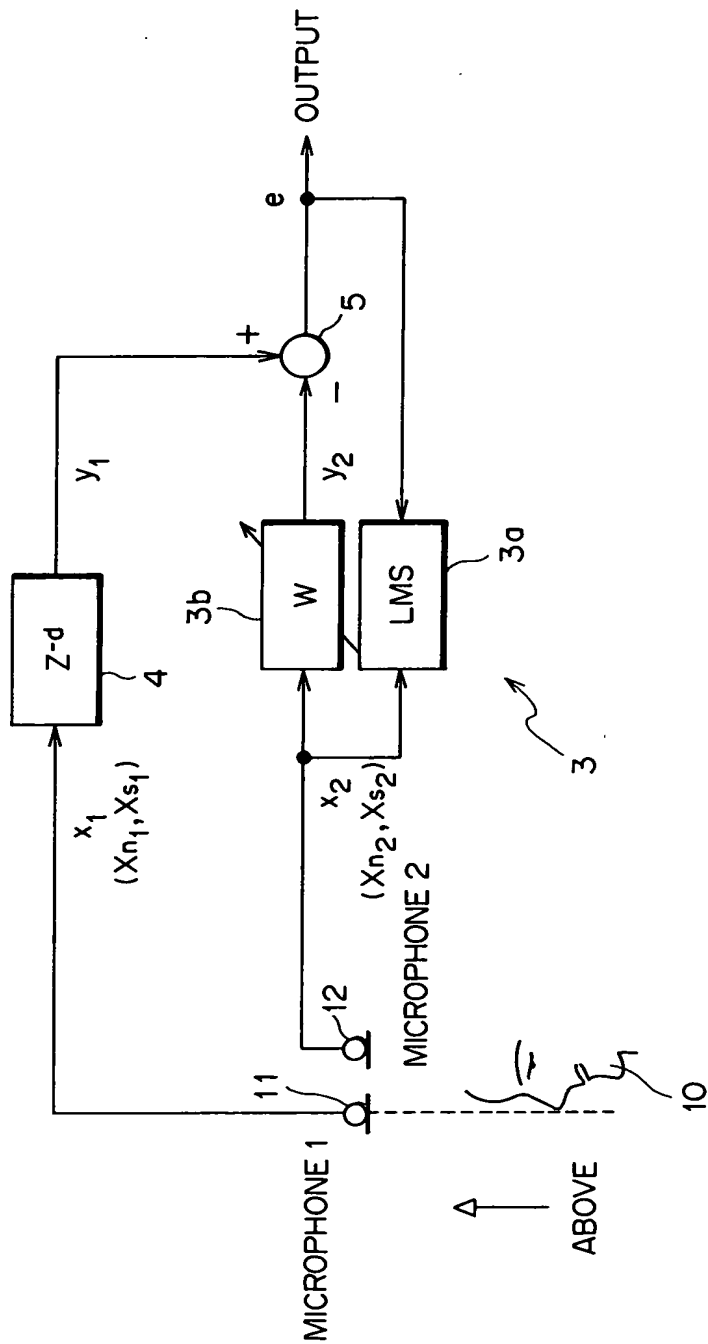


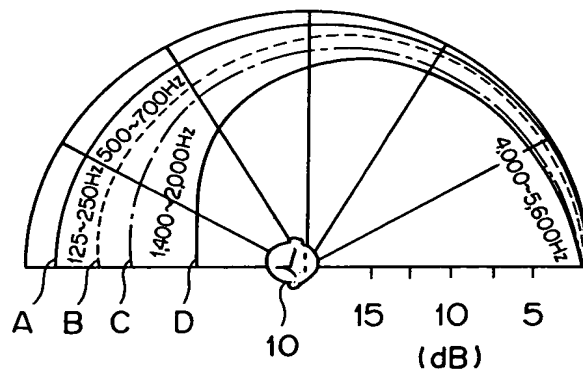
FIG. 9

CONFIGURATION OF THE MICROPHONE SYSTEM OF THE INVENTION



VOICE EMISSION CHARACTERISTICS OF A HUMAN BEING

FIG. 10(a)



A = 125 ~ 250Hz
 B = 500 ~ 700Hz
 C = 1,400 ~ 2,000Hz
 D = 4,000 ~ 5,000Hz

FIG. 10(b)

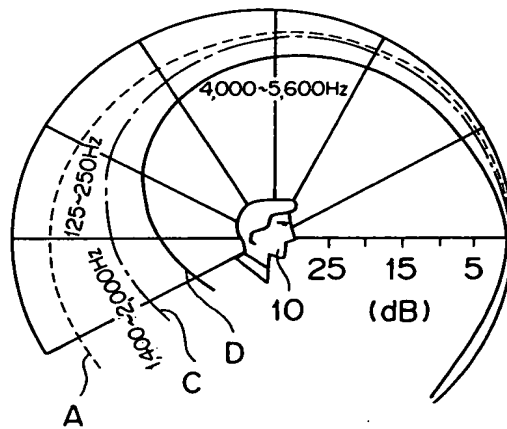


FIG. 11

CHART EXPLANATION OF POSITIONS OF THE PAIRED MICROPHONES

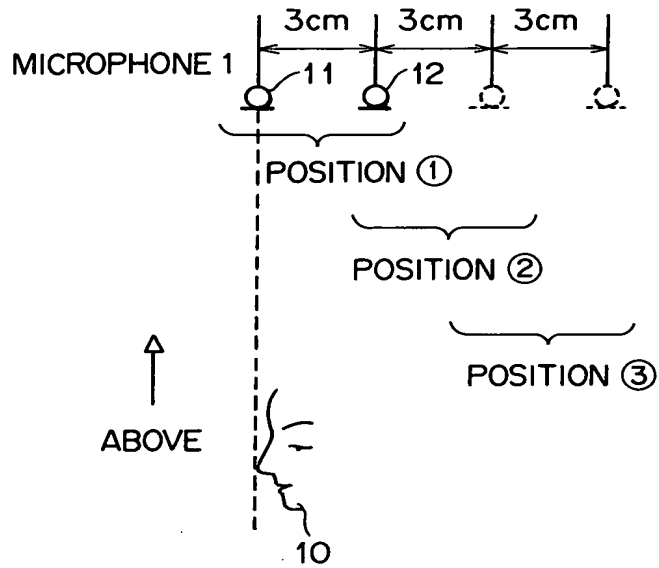


FIG. 12

RELATION BETWEEN THE POSITIONS OF THE PAIRED MICROPHONES AND THE SN IMPROVEMENT RATE

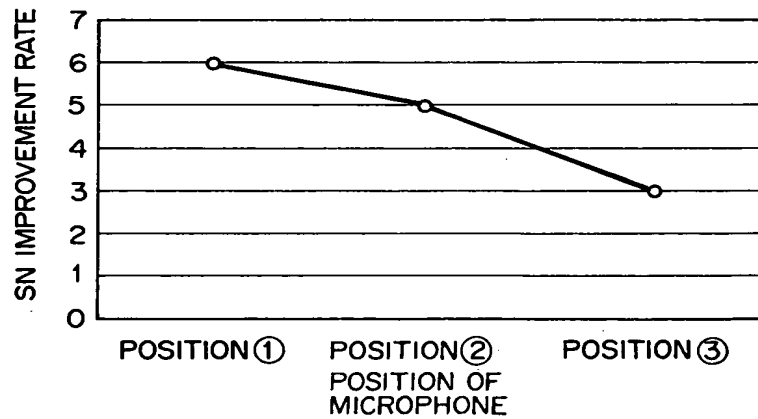


FIG. 13

CHART : EXPLANATION OF DISTANCE BETWEEN THE PAIRED MICROPHONES

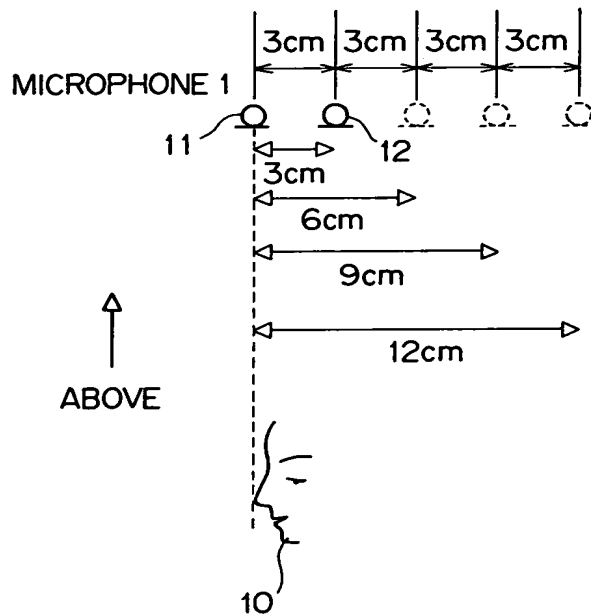


FIG. 14

RELATION BETWEEN THE DISTANCE BETWEEN THE PAIRED MICROPHONES AND THE SN IMPROVEMENT RATE

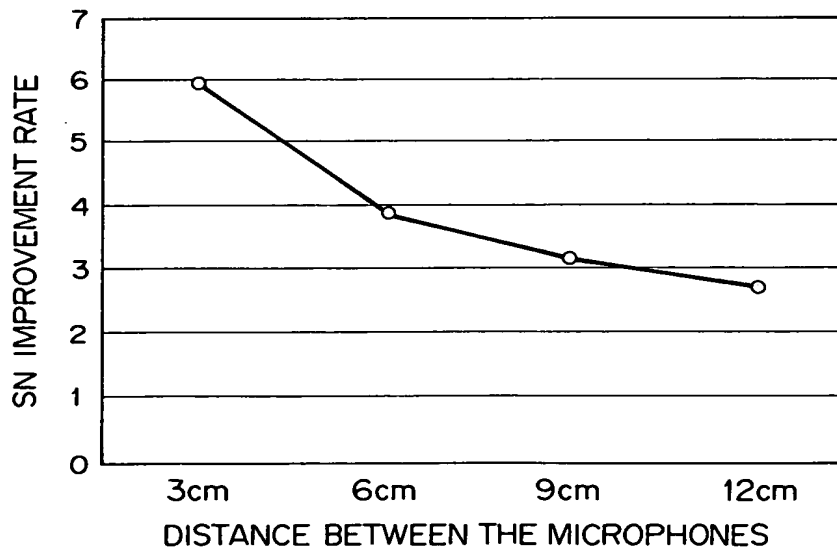


FIG. 15

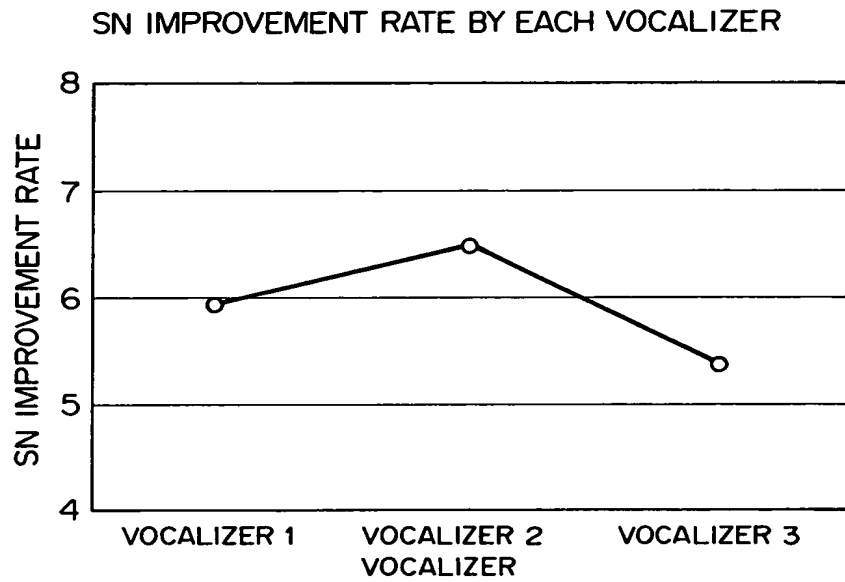


FIG. 16
PRIOR ART

RELATION BETWEEN SN RATIO AND RECOGNITION RATE

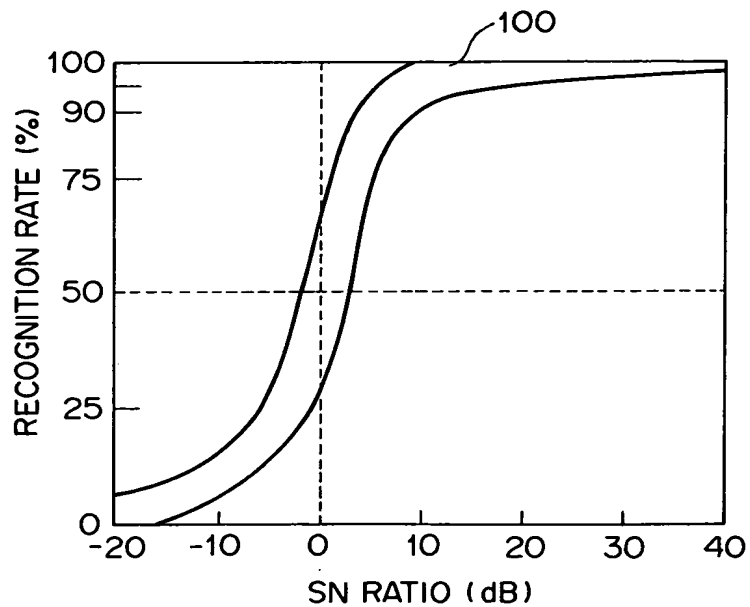
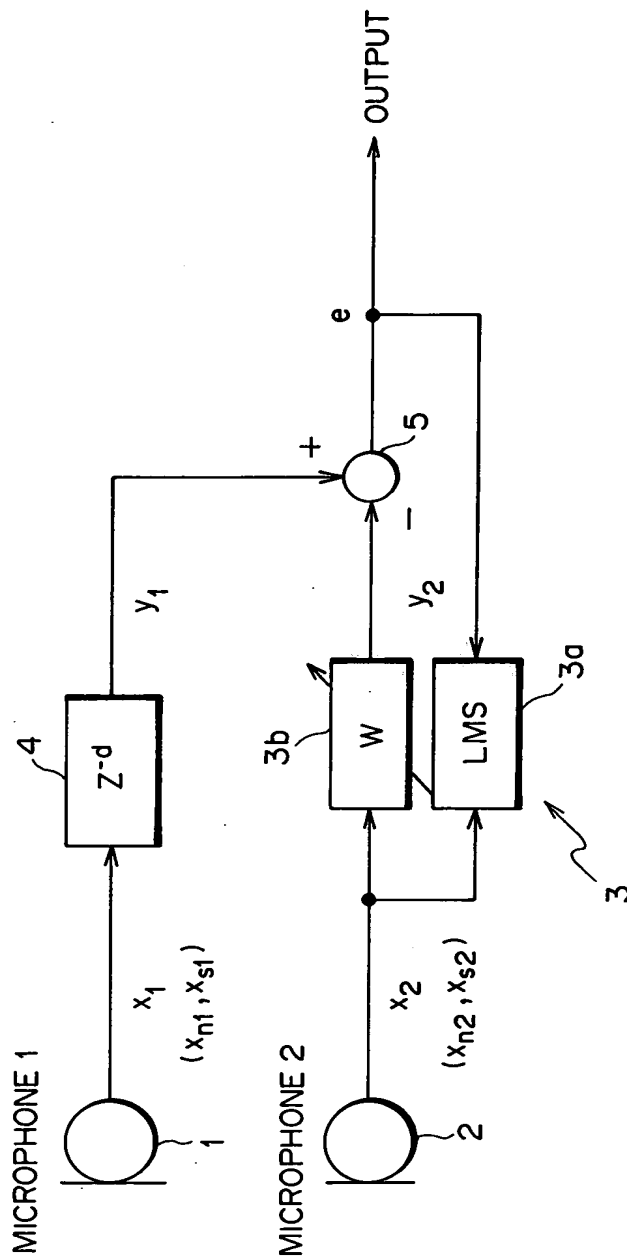


FIG. 17
PRIOR ART

CONVENTIONAL HIGH SN RATIO SOUND RECEPTION SYSTEM USING TWO MICROPHONES



CHARACTERISTICS OF TARGET RESPONSE SETTER

FIG. 18(a)

PRIOR ART

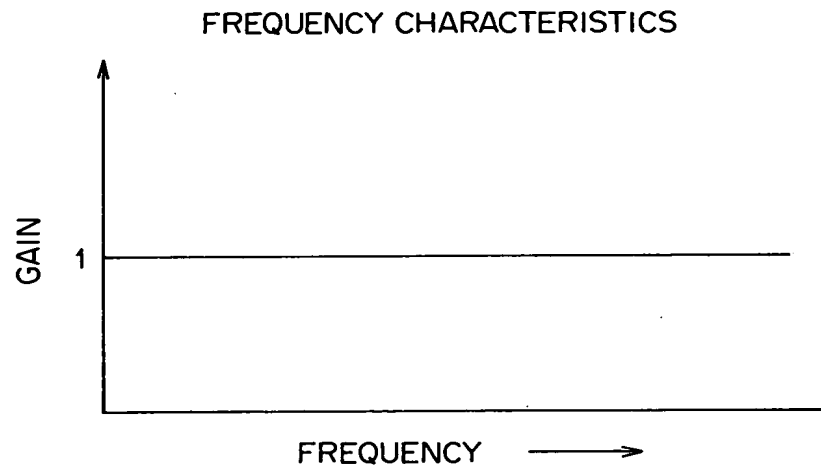
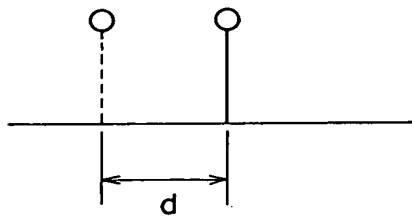


FIG. 18(b)

PRIOR ART

IMPULSE RESPONSE CHARACTERISTICS



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